

REMARKS

The Office Action dated March 22, 2006, has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claim 1-11 are currently pending in the application, of which claims 1 and 10 are independent claims. Claim 12 has been added to more particularly point out and distinctly claim the invention. No new matter has been added. Claims 1-11 are respectfully submitted for consideration.

Claims 1-2 were rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,376,940 of Shibuya et al. ("Shibuya"). Applicant respectfully traverses this rejection.

Claim 1, upon which claims 2-9 depend, is directed to a control method of a rotational speed of a screw for an injection molding machine, wherein rotation of a motor is transmitted the screw disposed within a cylinder member attached to an injection frame. The method includes sending an electric current to a stator attached to the injection frame. The method also includes rotating a rotor which is disposed radially inward of the stator, and which includes a hollow and cylindrical member and a magnet attached to the hollow and cylindrical member. The method further includes transmitting rotation of the rotor to the screw.

Applicant respectfully submits that Shibuya fails to disclose all of the elements of any of the presently pending claims.

Shibuya generally relates to a drive motor and drive apparatus for a molding machine. As explained at column 3, lines 6-15, Shibuya describes a motor in which the rotary motor section Mr includes a rotor 40 fixed to a shaft 3, and a stator 41 fixed to the casing, which together constitute a synchronous servomotor.

Claim 1 recites “rotating a rotor which is disposed radially inward of the stator, and which includes a **hollow and cylindrical member** and a magnet attached to the hollow and cylindrical member.” Applicant respectfully submits that Shibuya does not disclose or suggest at least this feature of claim 1.

The Office Action took the position that the rotor 40 of Shibuya corresponds to the claimed hollow and cylindrical member. However, Shibuya’s rotor 40 is essentially unitary with the shaft 3, which is not disclosed as being hollow, and is shown as solid, not hollow in the cross-sectional views provided by Shibuya. Indeed, column 3, lines 45-46 of Shibuya clearly states that the rotor 40 is fixed to the intermediate portion of the shaft 3, which means that Shibuya’s shaft 3 is not hollow. Accordingly, Shibuya does not disclose or suggest that the rotor includes a “hollow and cylindrical member.” Thus, Shibuya does not disclose or suggest all of the elements of claim 1, and it is respectfully requested that this rejection be withdrawn.

Moreover, claim 2 recites “wherein the rotation of the rotor is transmitted to the screw **via a rotary slide member**, so that the screw is rotated, and a resin entered to the injection molding machine is moved into and melted in the cylinder member.” Applicant respectfully submits that this feature is not disclosed or suggested by Shibuya.

The Office Action took the position that shaft 3 of Shibuya corresponds to the claimed rotary slide member. However, as explained in the specification at page 11, lines 14-25, the rotary slide member permits relative, as opposed to completely linked, motion between the screw and the rotor. In direct contrast, Shibuya's rotor is essentially unitary with the shaft 3. Shibuya indicates that the front end of the shaft is connected to the rear end of the screw. Thus, if Shibuya's rotor moves, then Shibuya's screw necessarily moves. Accordingly, Shibuya's shaft does not correspond to the claimed "rotary slide member." Therefore it respectfully submitted that Shibuya does not disclose or suggest all of the elements of claim 2, and it is respectfully requested that this rejection be withdrawn.

Claims 1-6 and 8-11 were rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent No. 1,004,421 of Emoto et al. ("Emoto I") or U.S. Patent No. 5,679,384 of Emoto ("Emoto II") in view of Shibuya. The Office Action took the position that Emoto I or Emoto II discloses "a similar method and apparatus." The Office Action took the position that although neither Emoto I nor II discloses attaching a magnet to the rotor, Shibuya discloses this feature, and thus it would have been obvious to provide such a magnet. Applicant respectfully traverses this rejection.

Claim 1, upon which claims 2-9 depend, is discussed above. Claim 10, upon which claim 11 depends, is directed to a control method of a rotational speed of a screw for an injection molding machine, wherein rotation of a motor is transmitted the screw disposed within a cylinder member attached to an injection frame. The method includes

sending an electric current to a stator attached to the injection frame. The method also includes rotating a rotor which is disposed radially inward of the stator, the screw, and an element to be detected. The method further includes detecting a rotational speed of the screw by a detecting element disposed in opposition to the element to be detected and in a manner where the detecting element does not come in contact with the element to be detected.

Applicant respectfully submits that the combination of Emoto I or Emoto II and Shibuya does not disclose or suggest all of the features of any of the presently pending claims.

Shibuya is discussed above. Emoto I generally relates to an injection molding machine. Emoto I aims to provide an injection molding machine with improved mechanical efficiency and reduced inertia, as explained at paragraph 0033 of Emoto I. In addition, Emoto I aims to reduce the axial length of the injection molding machine and facilitate assembly and maintenance of the machine.

Emoto II generally relates to an injection apparatus for an electric injection molding machine. Emoto II aims to provide an injection molding machine that facilitates maintenance and management, and that enhances accuracy in controlling speed and position of the screw, as explained at column 3, lines 13-19. Additionally, Emoto II aims to overcome some of the problems of previous injection molding machines such as the very large capacity requirement for metering motors.

Claim 1 recites “rotating a rotor which is disposed radially inward of the stator, and which includes a hollow and cylindrical member and **a magnet attached to the hollow and cylindrical member.**” Applicant respectfully submits that the combination of cited references does not disclose or suggest at least this feature of claim 1 and the claims that depend therefrom.

The Office Action took the position that this feature is taught by the combination of Emoto I or II with Shibuya. Specifically, the Office Action took the position that, although a magnet is not attached to the hollow and cylindrical member of Emoto I or Emoto II, it would have been obvious to so attach a magnet, in view of Shibuya’s teaching of a rotor with a magnet. The motivation provided by the Office Action was that “rotors with magnets are known when producing rotation.” Applicant respectfully disagrees with the Office Action’s analysis.

All that the Office Action’s analysis **tries** to establish (it is not admitted that the Office Action succeeded in this endeavor) is that it would be possible to combine Shibuya’s magnet with the hollow and cylindrical member of Shibuya, but does not establish that such a combination would be desirable. However, as MPEP Section 2143.01 indicates, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the **desirability** of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Accordingly, it is respectfully requested that this rejection be withdrawn.

Furthermore, as noted above, Shibuya describes magnets 40m provided at a rotor 40 of a solid shaft 3. However, generally the magnets 40m have magnetic forces. Hence, if a metal approaches the magnets 40m, the metal is attracted to the magnets by the magnetic forces and thereby the maintainability of the device is degraded. In addition, when maintenance and management is made for decomposition or check of the apparatus, special consideration is required to prevent a contaminant such as a metal powder from becoming adhered to the magnets 40m.

Thus, if Shibuya's magnets 40m were applied to the technique disclosed in Emoto, the object of Emoto's invention, namely to provide an injection molding machine that facilitates maintenance and management, cannot be achieved, and indeed would be undermined by the combination. Thus, one of ordinary skill in the art would not be motivated to make the combination suggested by the Office Action.

Accordingly, adding a magnet would require additional modifications to the motors of Emoto I and II, such as modifications to the relative positioning of the stator and the rotor. Such a redesign would have required that the stator be designed with an expanded interior radius, which would require the use of additional materials, added weight, additional cost, and a larger sized motor. As explained above, the references do not suggest the desirability of the combination. The downsides of modifying Emoto I or II as the Office Action proposed are self evident. Accordingly, without additional teaching, one of ordinary skill in the art would not be motivated to add the magnet of Shibuya's rotor onto the rotor of either Emoto I or Emoto II. The present application

discloses ways to advantageously incorporate such a magnet. However, such disclosure may not be used to establish obviousness. Therefore, it is respectfully requested that this rejection be withdrawn.

Claims 2-9 depend from claim 1 and recite additional limitations. Accordingly, it is respectfully submitted that each of claims 2-9 recites subject matter that is neither disclosed nor suggested by the combination of Emoto I or Emoto II and Shibuya.

Claim 10 recites “detecting a rotational speed of the screw by a detecting element disposed **in opposition to the element to be detected** and in a manner where the detecting element does not come in contact with the element to be detected.” Applicant respectfully submits that the combination of references does not disclose or suggest at least this feature of claim 10 or of claim 11, which depends from claim 10.

The Office Action took the position that this feature is disclosed by absolute pulse encoder 385 of Emoto I and absolute pulse encoder 85 of Emoto II. However, neither Emoto I nor Emoto II discloses that the encoder is “disposed in opposition to the element to be detected” as recited by claim 10. Accordingly, it is respectfully submitted that the disclosure of an absolute pulse detector does not inherently disclose disposing “a detecting element ... in opposition to the element to be detected.”

Furthermore, in Emoto I and Emoto II, the element to be detected is the shaft (365 or 65), and the encoder (385 or 85) is attached to the back of the shaft (365 or 65). Accordingly, it is unclear how the Office Action believes that the encoder (385 or 85) meets the further limitation “in a manner where the detecting element **does not come in**

contact with the element to be detected” as recited by claim 10. If the rejection is maintained, it is respectfully requested that the Office Action identify how it is ascertained that the detected “the detecting element does not come in contact with the element to be detected.”

Shibuya does not remedy the deficiencies of Emoto I and Emoto II because Shibuya is silent as to “detecting a rotational speed of the screw by a detecting element disposed in opposition to the element to be detected and in a manner where the detecting element does not come in contact with the element to be detected” as recited by claim 10. Thus, it is respectfully submitted that the combination of Emoto I or Emoto II and Shibuya does not disclose or suggest all of the elements of claim 10, or claim 11 that depends from claim 10. Therefore, it is respectfully requested that this rejection be withdrawn.

Additionally, Applicant respectfully submits that the standard for obviousness is not whether the references disclose similar features, but whether each and every element of the claimed invention is taught or rendered obvious. Accordingly, if these rejections are maintained, an explanation of the teachings of the references as to each and every element of the claims is respectfully requested, so that meaningful review of the rejections may be made.

Claims 6-7 were rejected under 35 U.S.C. 103(a) as being unpatentable over Emoto I or Emoto II and Shibuya in view of U.S. Patent No. 5,864,192 of Nagate et al. (“Nagate”). Applicant respectfully traverses this rejection.

Claims 6-7 depend from claim 1. The deficiencies of the combination of Emoto I or II and Shibuya with regard to claim 1 are discussed above. Nagate does not remedy the deficiencies of Emoto I or Emoto II and Shibuya because Nagate does not provide disclosure or suggestion that would motivate one of ordinary skill in the art to add Shibuya's rotor magnet to the rotor of Emoto I or Emoto II.

Nagate generally relates to a brushless motor with magnetic sensor to detect leaked magnetic flux. Nagate is silent as to "rotating a rotor which is disposed radially inward of the stator, and which includes a hollow and cylindrical member and a magnet attached to the hollow and cylindrical member." Accordingly, it is respectfully submitted that the combination of Emoto I or Emoto II, Shibuya, and Nagate fails to disclose or suggest all of the elements of claims 6 and 7, which depend from claim 1.

Nagate, however, at column 18, lines 39-67 discusses using a magnetic sensor (Hall IC 16) for detecting a rotational position of a working rotor. The sensor 16 is provided at a magnetic sensor board 15 arranged inside a brushless motor 1. However, if the magnetic sensor 16 is arranged inside the motor 1 neighboring a rotor 8, as shown in Nagate, maintainability is degraded. In addition, it is not possible to readily determine if a problem of the motor is due to a problem of the sensor or the motor itself when a motor problem occurs. Thus, one of ordinary skill in the art would not be motivated to combine Nagate with Emoto II, because Emoto II aims to facilitate maintenance and management, and Nagate would undermine those objectives.

Indeed, Applicant respectfully submits that there is no motivation to combine Emoto I or Emoto II and Nagate. The Office Action suggested that the motivation is that the results of doing so would have been the same as proposed by either Emoto I or Emoto II. Applicant respectfully submits that the standard for obviousness requires that there be teaching, motivation, or suggestion in the art as to the desirability of the combination. A combination that would be expected not to produce any net benefit while adding complexity to the design (such as Nagate proposes) and require engineering effort to integrate the teachings into the design, would not – on its face – be a desirable modification to one of ordinary skill in the art. Accordingly, even assuming that Nagate’s teachings would provide similar results (not admitted), it would not have been obvious to one of ordinary skill in the art to combine Nagate’s teachings with those of Emoto I or Emoto II.

Claims 1-11 were rejected under 35 U.S.C. 103(a) as being unpatentable over Emoto I or Emoto II in view of Nagate. Applicant respectfully traverses this rejection.

The claims and references are discussed above. With regard to claim 1, and claims 2-11, as explained above, the combination of Emoto I or Emoto II, Shibuya, and Nagate fails to disclose all of the elements of the claims, and therefore the reduced combination of Emoto I or Emoto II and Nagate fails to disclose all of the elements of the claims.

With regard to claims 10 and 11, claim 10 recites “detecting a rotational speed of the screw by a detecting element disposed in opposition to the element to be detected and

in a manner where the detecting element does not come in contact with the element to be detected” and claim 11 depends from claim 10. As explained above, Emoto I and Emoto II fail to disclose or suggest at least this element of claims 10-11. Nagate does not remedy the deficiencies of Emoto I and Emoto II.

Nagate is discussed above, but Nagate is silent as to “detecting a rotational speed of the screw by a detecting element disposed in opposition to the element to be detected and in a manner where the detecting element does not come in contact with the element to be detected.” The Office Action asserted that Nagate teaches the use of magnetic lines, and thus it would have been obvious to use the “magnet detector” (sic) of Nagate because it would “provide similar speeds to the encoder.” Applicants respectfully submit that simply producing similar results is not a motivation to modify either of Emoto I and Emoto II. Nevertheless, whether the combination is motivated is moot, because the combination does not disclose or suggest all of the elements of any of the presently pending claims. Therefore, it is respectfully requested that this rejection be withdrawn.


Moreover, for the reasons explained above, it would not have been obvious to one of ordinary skill in the art to combine Nagate and Emoto I or Emoto II. It is, therefore, respectfully requested that the rejection be withdrawn for this additional reason.

For the reasons explained above, it is respectfully submitted that each of claims 1-12 recites subject matter that is neither disclosed nor suggested in any combination of the cited references. Accordingly, it is respectfully requested that all of claims 1-12 be allowed and that this application be passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, Applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, Applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,


Peter Flanagan
Registration No. 58,178

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

PCF:kzw

Enclosure: Petition for a Two-Month Extension of Time; Check No. 14894